The Photosystem II Light-Harvesting Protein Lhcb3 Affects the Macrostructure of Photosystem II and the Rate of State Transitions in Arabidopsis

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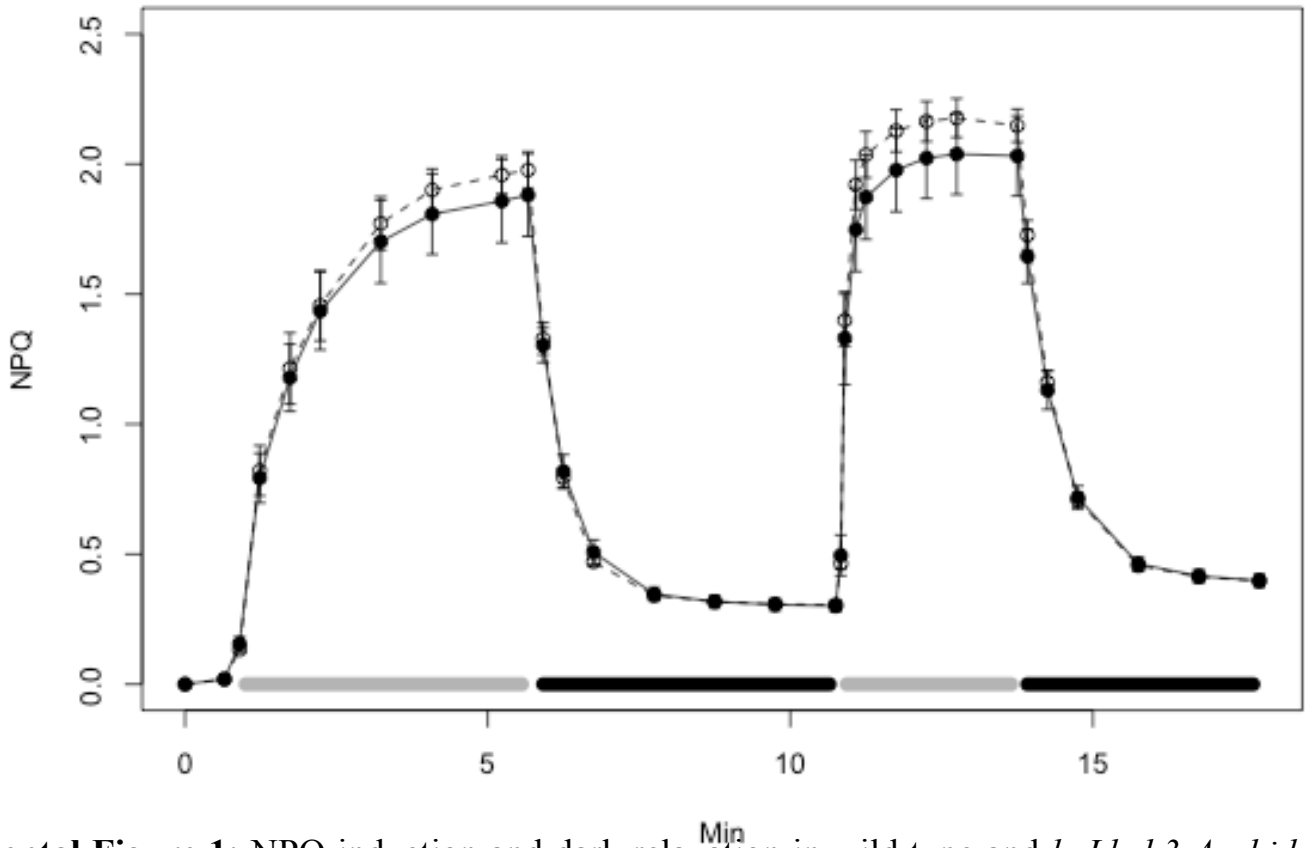
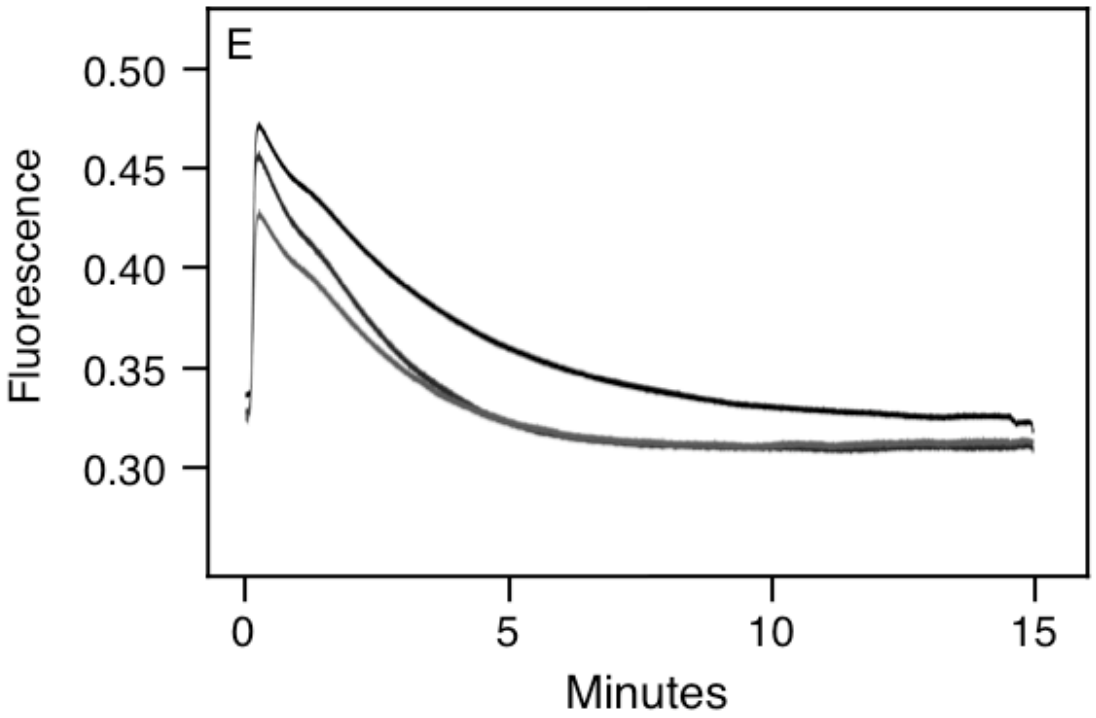
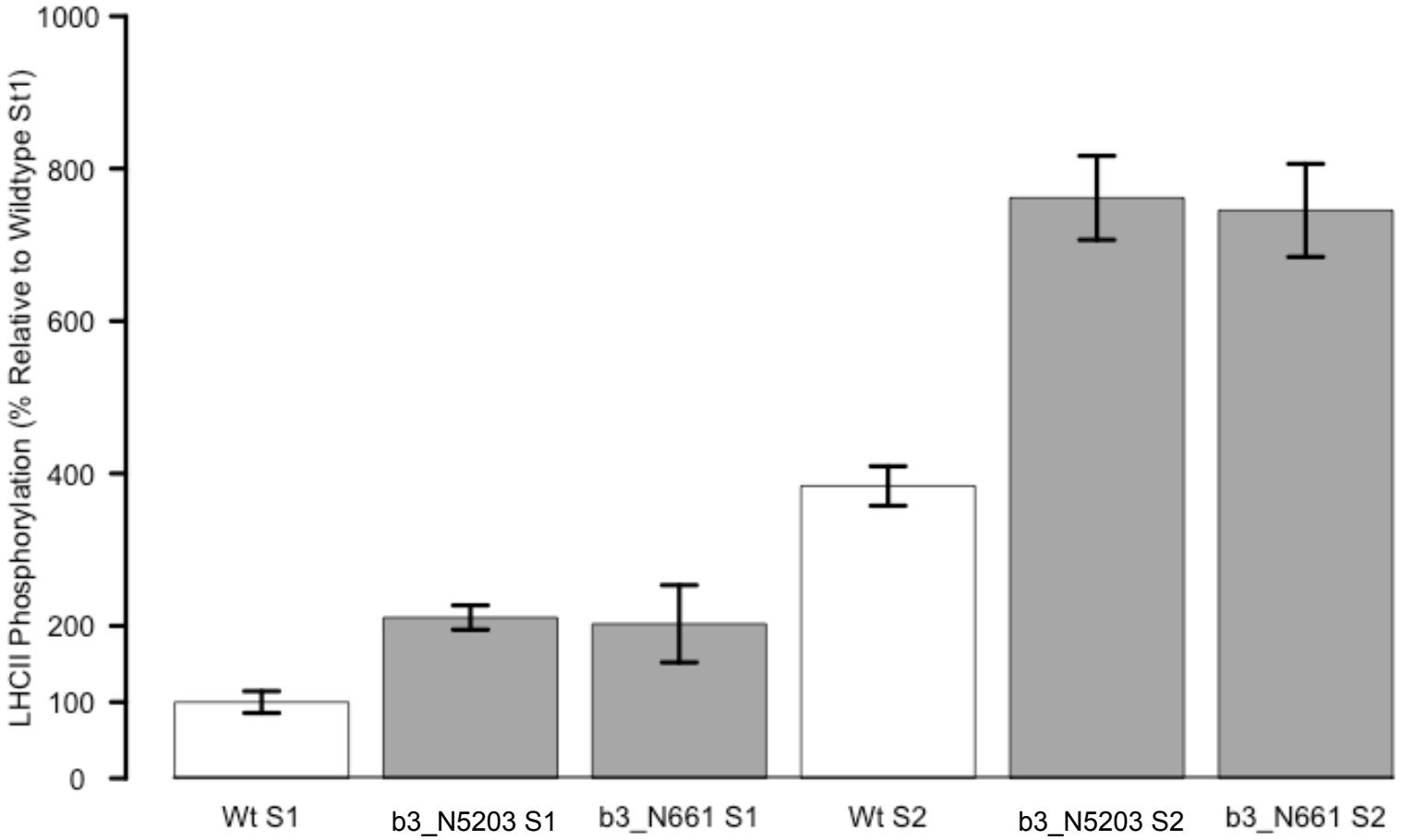
Supplemental Data Damkjær et al (2009). The Photosystem II light harvesting protein Lhcb3 affects the macrostructure of photosystem II and the rate of state transitions in *Arabidopsis*



Supplemental Figure 1: NPQ induction and dark relaxation in wild type and *koLhcb3 Arabidopsis* plants. NPQ was measured at 1000 microE actinic light treatment in wild type (closed symbols, full line) and *koLhcb3* (open symbols, dashed line) *Arabidopsis* plants. Error bars show SE, n=5. The grey bars show when the actinic light is on and black bars show when actinic light is off.

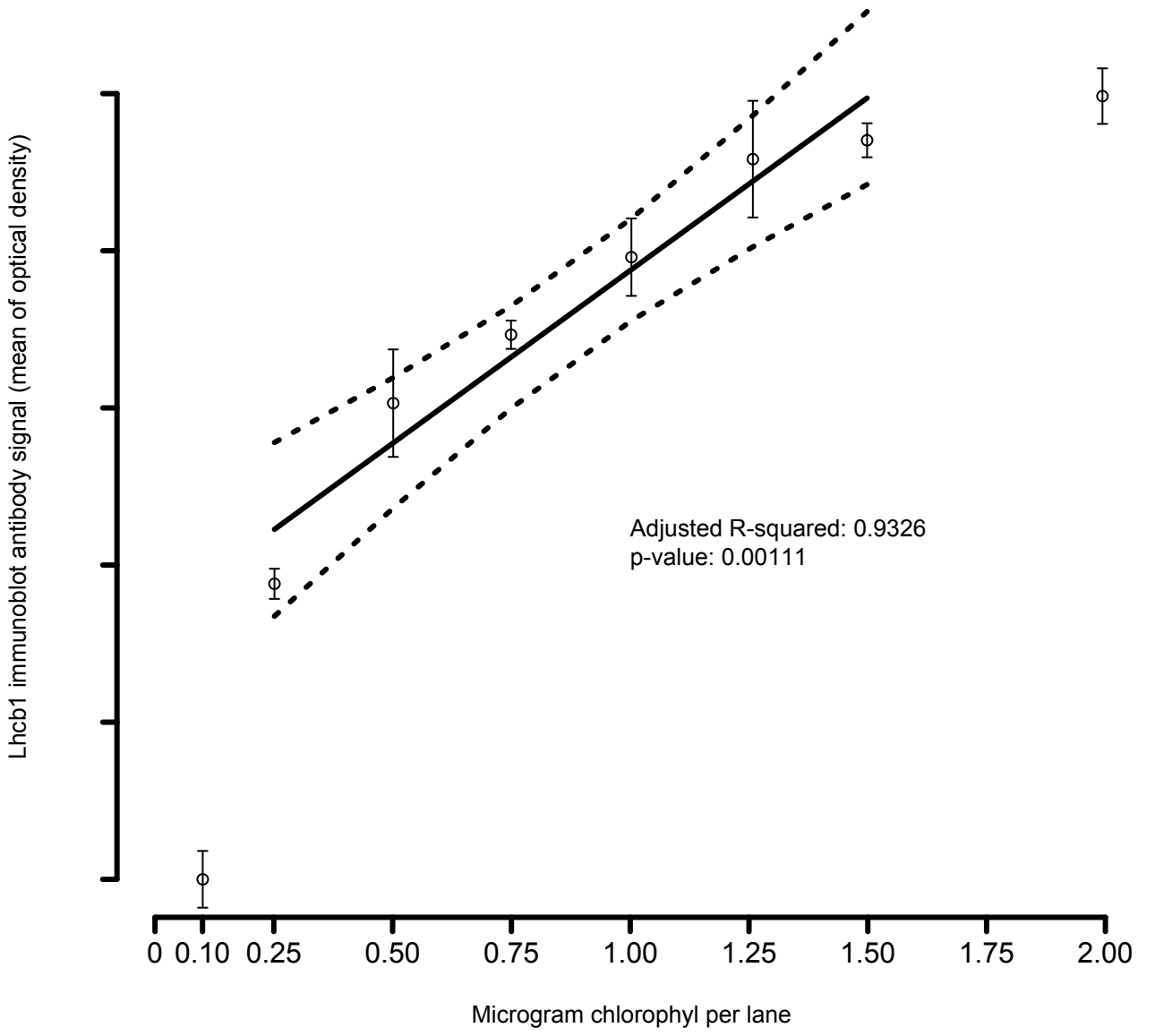


Supplemental Figure 2. State 1 to State 2 transition induced by PSII light treatment after 15 minutes PSI light (far red) illumination (n=6). The upper (black) trace shows wild type, the two lower (grey) trace shows koLhcb3 lines N520342 and N661731.

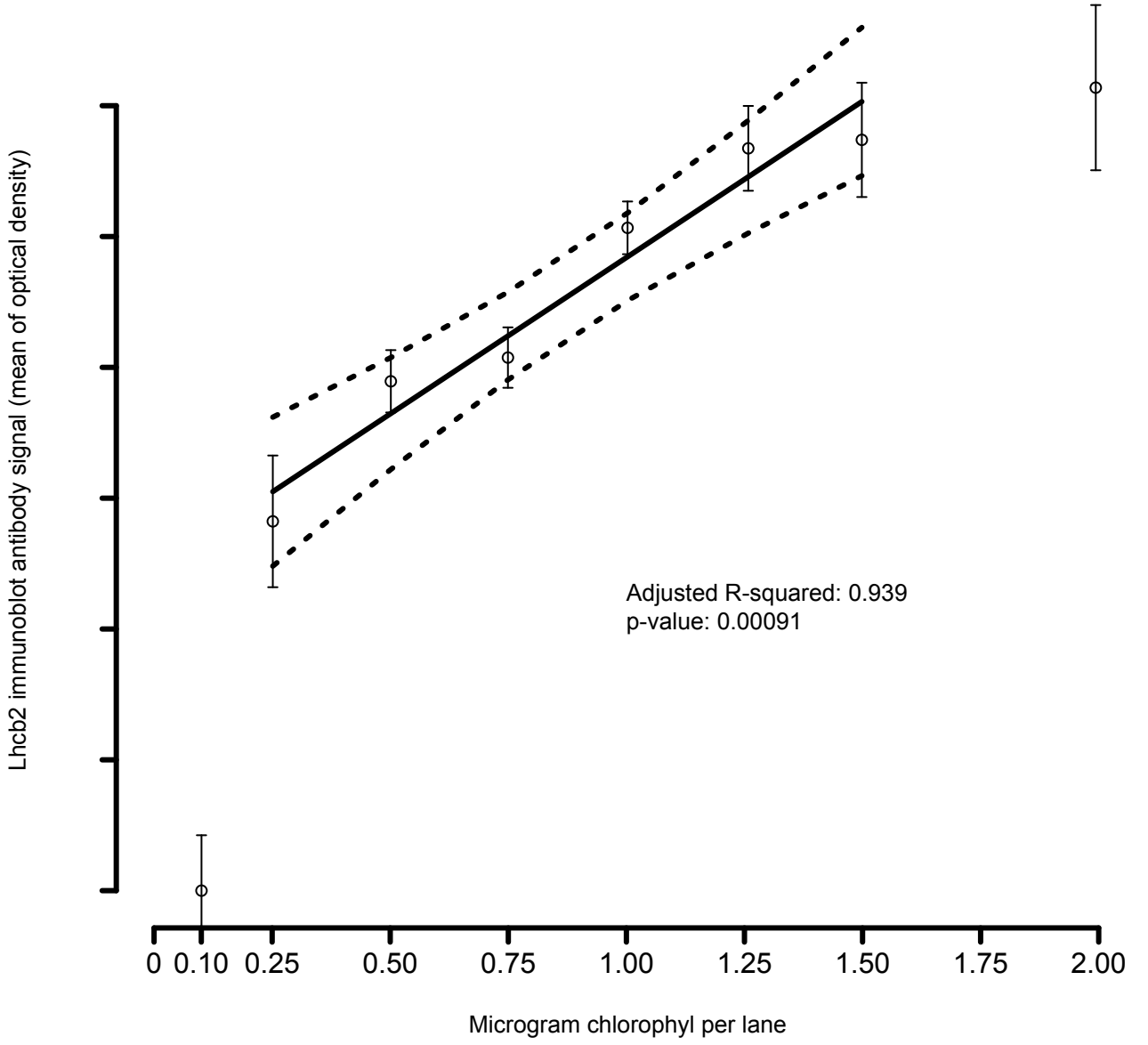


Supplemental Figure 3. In vivo LHCII phosphorylation in wild type (white bars) and koLhcb3 lines N520342 and N661731 (grey bars) *Arabidopsis* thylakoids isolated following State 1 and State 2 inducing light treatments. Results are normalised to wild type state 1 phosphorylation, corrected relative to the CP47 phosphorylation signal. Error bars show SE, n= 1 3

Supplemental Figure 4. Linear range of the Lhcb1 antibody signal.



Supplemental Figure 5. Linear range of the Lhcb2 antibody signal.



Supplemental Table 1: ANOVA analysis of the significance of the interaction between genotype (Wild type or *koLhcb3*) and treatment (State 1 or State 2 light) with regard to PSII antennae size measured using maximal fluorescence and 15 minute light treatments. ** indicate statistically significant differences ($p < 0.01$) and *** statistically significant differences ($p < 0.001$) using the ANOVA test for variance,, n=13.

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	Df	**Sum Sq**	**Mean Sq**	**F value**	**Pr(>F)**	
Genotype	**1**	0.00119	**0.00119**	0.5855	**0.451053**	
State	**1**	0.097667	**0.097667**	48.0731	**2.318E-07**	***
Sample date	**3**	0.037241	**0.012414**	6.1102	**0.002741**	**
Genotype:state	**1**	0.001824	**0.001824**	0.8979	**0.352082**	
Residuals	**26**	0.052822	**0.002032**			

Supplemental Table 2: ANOVA analysis of the significance of the interaction between genotype (wild type or *koLhcb3*) and treatment (State 1 or State 2 light) with regard to LHCII phosphorylation. ** indicate statistically significant differences ($p < 0.01$) and *** statistically significant differences ($p < 0.001$) using the ANOVA test for variance, n=27.

	Df	**Sum Sq**	**Mean Sq**	**F value**	**Pr(>F)**	
Genotype	**1**	**4.8327E+11**	**4.8327E+11**	**46.539**	**5.572E-10**	***
State	**1**	2.0593E+12	**2.0593E+12**	198.3116	**< 2.2e-16**	***
Prep Date	**1**	6.6701E+12	**6.6701E+12**	642.3288	**< 2.2e-16**	***
Sample Date	**2**	5.1757E+11	**2.5878E+11**	24.9209	**1.303E-09**	***
Genotype:State	**1**	8.9476E+10	**8.9476E+10**	8.6165	**0.004078**	**
Residuals	**107**	1.1111E+12	**1.0384E+10**			

Supplemental Table 3. Seed set of wild type and *koLhcb3* Arabidopsis plants in the field.

	Wildtype	*koLhcb3*	t-test p-value
Mean siliques per plant	149 ± 13	152 ± 14	0.8884
Mean seeds per siliques	52.1 ± 0.9	49.3 ± 1.2	0.0623
Mean seeds per plant	7783 ± 682	7683 ± 807	0.9226